The Citrus Industry

Representative of Every Interest

Representing No Special Interest

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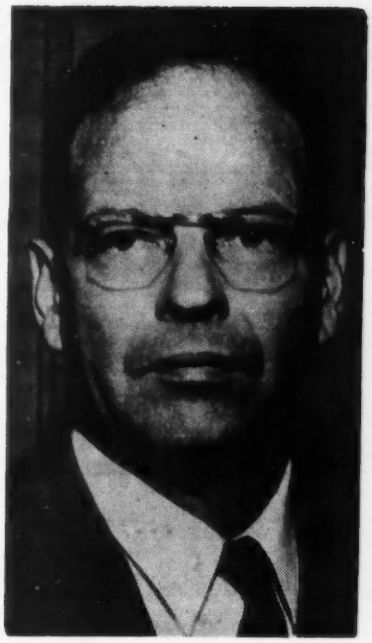
AMONG FLORIDA CITRUS WORKERS



R. E. NORRIS
President Florida State Horticultural Society

VOL. 38 — NO. 10 OCTOBER, 1957 BARTOW, FLORIDA

Meet the tree that almost met a bulldozer

. . . saved by VERSENE IRON CHELATE

Not long ago, this tree was tagged to be torn out by a bulldozer. Its leaves had yellowed and dropped . . . limb by limb it was dying. All it lacked was iron!

VERSENE® IRON CHELATE saved this tree . . . and thousands of others like it . . . by satisfying their iron-hunger. In a year, trees given up for lost were back in full foliage, bloom and production.

Of course, growers no longer wait for dieback to show them the need for iron. At the first sign of yellowing, VERSENE IRON CHELATE is used to cure iron deficiencies.

Keep your grove in good, green health. Use VERSENE IRON CHELATE in concentrated form for mixing with water or liquid fertilizers. Get VERSENE IRON CHELATE on Vermiculite for direct application . . . or with dry fertilizers. Your Dow dealer—or fertilizer formulator—will furnish additional information. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Dept., Midland, Michigan.

WEED AND BRUSH KILLERS, SOIL FUMIGANTS, GRAIN FUMIGANTS, INSECTICIDES, IRON CHELATES, FEED ADDITIVES, ANHYDROUS AMMONIA, DEFOLIANTS.

Dow presents
The Red Foley Show
every Saturday. Consult radio listing for time and station.

YOU CAN DEPEND ON DOW

R. M. Pratt

Citrus Insect Control For October 1957

R. B. Johnson

W. L. THOMPSON
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment Station, Lake Alfred

W. L. Thompson

Activity of all major pests has been at an unusually low level in September, but an increase in infestations can be expected in October.

Both red and purple scale activity is increasing. Except for spot infestations, red scale will not be a serious problem this fall. Purple scale will increase in October and the population will be above average by December. Some damage from fruit infestations will result.

In general, purple mite infestations will be low in October, but growers are reminded that even relatively low populations can cause serious leaf drop during cold, dry weather.

Rust mite infestations are still extremely low, but an increasing trend is expected in October and the level will be rather high by the end of the month.

Texas citrus mites have been increasing progressively in both abundance and distribution during the last few years. They are sometimes more of a problem than purple mite.

SPRAY PROGRAM

Rainfall has been adequate during the past summer so that trees are in a vigorous growing condition and look better than they have for the past three years. Since the trees are in good condition, all precautions should be taken to keep them that way. Scale insects and mites, especially purple scale and purple mites, strive on vigorous growing foliage. Although red scale infestations are not so heavy this fall, some infestations have been reported and if warm weather continues through October, light to medium infestations could develop into heavy infestations by November or later. Purple scale should also be watched closely and if there is any doubt, a scalicide should be applied to prevent a fruit drop later in the year. Where either chaff or purple scale have settled on the fruit, the area around the scale does not degreen in the coloring room. It is too late to do anything on oranges or grapefruit that are to be shipped in October or early November, but a parathion spray could be applied on infested tangerines to be shipped in November or later. Do not use oil on tangerines at this time of the year.

Inspect young groves for grasshoppers. After the cover crop is chopped down, the grasshoppers will migrate to the trees.

Tangerines and early varieties of oranges should be checked for plant bugs. Special attention should be paid to groves where the citron melon is growing. Plant bug populations build up on citrons and later may attack the fruit on trees and cause them to drop.

Scale Control: Parathion (15 percent) at 1.7 pounds or its equivalent, or malathion (25 percent) at 3 to 5 pounds per 100 gallons are recommended at this time of the year. Parathion does not control soft brown scale and malathion has not been very effective against chaff scale. Oil sprays are effective but are not recommended on bearing trees in October or later. An October oil spray will definitely retard degreening and unless cold weather develops, the fruit may never color to the extent it should. The oil may also depress solids in the juice as late as mid-November. Sometimes October oil sprays affect the trees so they do not set the normal amount of fruit the next spring and they are also more susceptible to freezing temperatures that may occur anytime during the winter. The adverse effects of oil are always more pronounced where a summer application is followed with another one in October or later.

Purple Mite and Texas Citrus Mite Control: It is hoped that purple mite populations will continue to be low until cooler weather occurs because, with the exception of oil, the materials now on the market are not very effective in warm weather. For best results, regardless of the miticide used, a thorough application should be made before more than 20 percent of the leaves are infested.

DN Dry Mix at 2/3 pound per 100 gallons is most effective when applied before eggs become numerous. It should not be applied when the temperature is above 88 degrees. It sometimes causes a slight injury where a drop of spray dries on the lower half of the fruit and this injury may be more severe where parathion has been mixed with the spray. This injury is most likely to occur on Hamlins and Pineapple oranges. A mixture of DN and parathion sometimes causes a leaf drop. A 1½ percent DN-sulfur dust is effective for light infestations. No injury has

(Continued from page 27)

SCALE AND MITE ACTIVITY BY DISTRICTS*

District	Purple Scale	Red Scale	Purple Mite	Rust Mite on leaves	Rust Mite on fruit
West Coast	3.64	3.43	1.43	1.93	2.14
Indian River	3.14	4.00	.93	.85	.84
Upper East Coast	4.00	4.60	1.20	.60	.60
Gainesville	4.33	.67	0	.40	.80
Orlando	2.86	2.76	.37	.41	.46
Brooksville	4.32	.44	1.19	1.57	1.93
Ridge	3.95	3.13	1.00	.96	1.14
Bartow	2.61	.54	1.36	.67	1.11
State Average	3.55	3.28	.93	.97	1.16
Last Year	3.37	3.47	.80	1.88	2.11

*Fourth week in September. Activity is computed from populations, amount of hatching of scales, and number of groves with increasing or decreasing infestations. Activity is considered high if above 4.0 for purple scale, 3.0 for red scale, and 1.5 for mites.

* Written September 24, 1957. Reports of surveys by Harold Holtsberg, Fort Pierce; J. W. Davis, Tavares; K. G. Townsend, Tampa; T. B. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.

GROWER'S OWN PAGE

LONE LADY DEVELOPS OWN CITRUS GROVE

MRS. W. J. PLACIE
Hale Road
Land O' Lakes, Fla.

Gentlemen:

I have been reading your "CITRUS INDUSTRY" magazine now for quite some time. Would like to tell you that your many interesting articles have helped me out many times. So, I have been wondering if my story might interest you.

I am a widow, 61 years old. I lost my husband in Tampa in 1950. We owned this 45-acre farm that is on a beautiful cypress studded lake since 1947. However, we did nothing to the land except to clear off all trees. I sold my Tampa home and decided to come here and live and try to make my farm pay off. First thing I did was to have a pretty small home built in which I moved in and have lived all alone since 1952. I got the idea that cattle business was a pretty good bet so hired a couple of men to plow up 28 acres of land and plant Pangola. When the grass got to be heavy and the fences were up, I proceeded to buy me several head of steers. Not knowing anything about the cattle business, I bought yearlings that had a lot of dairy in them. Any one knows, that you just can't fatten steers with dairy in them but I poured on the feed and when I had them a year, sent them to market and lost $110 on ten head.

The thought began to penetrate that had I planted that 28 acres to citrus how much smarter I would have been. That as time went on, the trees would grow and each year, after they started to produce, would bring me in more and more money. So, in January of 1954 I decided I'd take out ten acres and put it in a grove. In the meantime, the Pangola had had two heavy applications of fertilizer each year, plus limestone, dolomite, and I don't know what all. So, if you know anything about Pangola, you have an idea what it is like to try and get rid of it. I hired a man to come in with a tractor and plow and as the land was awfully dry, we burned this ten acres. Then he plowed it and a few days later went over it with a harhow. We hadn't had any rain for a couple of months so the ground was unusually dry. As soon as he had finished with the harrow, a heavy rain came up which lasted all day and all night. That meant nothing more could be done until it dried off which took about two months.

He came in again and gave it a good disking and that evening it

started to rain again and it poured rain for six hours. I had to let it stand for another couple of weeks and then I decided I'd finish the job. I have my own tractor and other equipment and had been doing all that type of work myself. When the land dried out I started in and luck was with me. I disked over and over again and kept at it all thru the summer months. By September all Pangola had been distroyed. I had been warned by quite a number of grove owners that if I did not destroy it entirely, that when the trees would be fertilized it would grow so heavy around the tree that they couldn't be hoed and in the end, the grass would strangle the tree. Naturally, I didn't want that to happen so I made sure it was gone. My Hamlin trees were planted November 2, and hilled for the winter. There were 710 trees as the area I had laid out was a trifle larger than ten acres. I knew nothing about the citrus culture but was told that when the hills were taken away in the spring, my work would start in earnest. I had no help so I knew it would be up to me and me alone to see that this grove was successful.

The trees were small whips when planted and only the tops showed above the hills. I started to fertilize in February. Every six weeks for the following year and a half except during the coldest months, I walked from tree to tree with a small tub filled with fertilizer. I

(Continued on page 11)

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EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
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Representing no special interest

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Preliminary Program 70th Annual Meeting

Florida State Horticultural Society

Miami Beach, October 29-31, 1957

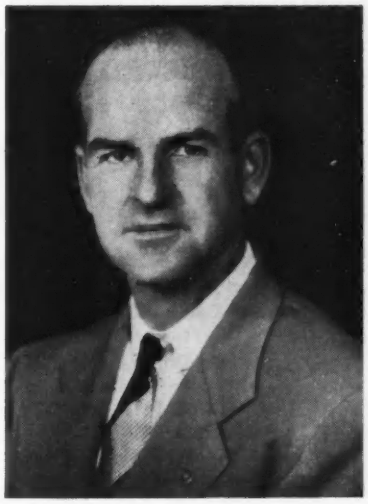
Empress Hotel
Miami Beach, Florida

General Session — Coronation Room.
Citrus Section — East Coronation Room.
Vegetable Section — Regency Room.
Krome Memorial Section — West Coronation Room.
Processing Section — South Card Room.
Ornamental Section — Penthouse Club.

All papers will start promptly on schedule as shown so that it will be possible to go from one section to another to hear papers of personal interest.

GENERAL SESSION
Wednesday Morning, October 30, 1957
9:00 A. M.
Coronation Room
R. E. Norris, President
Presiding

Invocation, Rev. Arthur J. Rantz, St. Thomas Episcopal Church, South Miami.
Director, Convention Bureau, Miami Beach.
Address of Welcome, Tom F. Smith,
Response to Address of Welcome, G. Franklin Ward, Avon Park.
President's Address, R. E. Norris Tavares.
Annual Business Meeting.
Some Present Problems and Future Possibilities in Florida's Agriculture as they Relate to the Facilities and Staff of the Florida Agricultural Experiment Stations. J. R. Beckenbach, Director, Agricultural Experiment Stations, Gainesville.



DR. ERNEST L. SPENCER
SECRETARY OF THE SOCIETY

Better Methods of Preserving the Quality of Fresh Fruits and Vegetables W. T. Pentzer, Chief, Biological Sciences Branch, Marketing Research Division, Washington, D. C.

ANNUAL BANQUET
Wednesday, October 30, 1957
7:00 P. M.
Toastmaster:
Dr. Ralph L. Miller, Orlando

CITRUS SECTION
Charles D. Kime, Jr., Vice President, Presiding
Tuesday Afternon, October 29

2:00 — Future Plans for Fruit Department at University of Florida, John W. Sites, University of Florida, Gainesville.

2:20 — The Ascorbic Acid Concentration in Grapefruit as Related to Size, W. G. Long, P. L. Harding, USDA, Orlando, and M. J. Soule, Jr., Citrus Experiment Station, Gainesville.

2:40 — The Effect of Pack-Out on Grower Profits. W. Grierson, Citrus Experiment Station, Lake Alfred.

3:00 — Intermission.

3:10 — Fruit Factors That Affect the Quality of Frozen Concentrated

Orange Juice. F. W. Wenzel, E. L. Moore and E. J. Deszyck, Citrus Experiment Station, Lake Alfred.

3:45 — Cultivation Trials in a Young Bearing Grapefruit Grove on Sandy Ridge Soil, Robert E. Norris, Agricultural Extension Service, Gainesville, and Paul F. Smith, USDA, Lake Alfred.

4:10 — Factors Relating to Dieback and Growth Response of Young Transplanted Citrus Trees, Gordon R. Grimm, USDA, Orlando.

4:25 — Sectional Business Meeting.

Wednesday Afternoon, October 30

2:00 — Phosphatic Inseticides Mixed with Oil Emulsion for Scale Control, and Their Effect on Fruit Quality, W. L. Thompsn and E. J. Deszyk, Citrus Experiment Station, Lake Alfred.

2:20 — Comparison of Experimental Miticides for Control of Purple Mite on Citrus, John E. King, and R. B. Johnson, Citrus Experiment Station Lake Alfred.

2:45 — Zineb Controls Citrus Rust Mite, R. B. Johnson, John R. King, and J. J. McBride, Jr., Citrus Experiment Station, Lake Alfred.

3:00 — Intermission.

3:10 — Relation Between Moisture Conditions and Rust Mite Infestations, R. M. Pratt, Citrus Experiment Station, Lake Alfred.

3:30 — Heat Treatments for Obtaining Sources of Virus-Free Citrus Budwood, Theodore J. Grant, USDA, Orlando.

3:50 — Occurrence of Wood Pocket (Blotch) in Florida, with Particular Reference to the Variety Tahiti Lime, L. C. Knorr, Citrus Experiment Station, Lake Alfred, and J. F. L. Childs, USDA, Orlando.

Thursday Morning, October 31

9:00 — Current Position of Plant Board in Control of the Burrowing Nematode, Ed L. Ayers, State Plant Board, Gainesville.

9:10 — The Current Information Relating to Barriers for the Burrowing Nematode, R. F. Suit, Citrus Experiment Station, Lake Alfred.

9:30—Anatomy of Burrowing Nematode-Infested Roots. E. P. DuCharme, Citrus Experiment Station, Lake Alfred.

9:50—Rootstock Screening Program in Relation to the Burrowing Nematode, W. A. Feder, USDA, Orlando, and Harry W. Ford, Citrus Experiment Station, Lake Alfred.

10:10 — Intermission.

10:20—Reaction of Citrus to The Burrowing - Nematode - Infested Soils, Julius Feldmesser, and W. A. Feder, USDA, Orlando.

10:35 — Observations on the Recovery of **Radopholus** and **Pratylenchus** from Infected Citrus Feeder Roots, W. A. Feder and Julius Feldmesser, USDA, Orlando.

10:50 — The Experimental Studies on Citrus Nemotades. George Renninger and Dr. Boris Sokoloff, Florida Southern College, Lakeland.

11:10 — Panel — "We Know The Answers!" Howard Thullbery, Moderator, Superior Fertilizer & Chemical Company, Lake Wales.

* * *

VEGETABLE SECTION

Norman C. Hayslip, Vice President Presiding

Tuesday Afternoon, October 29

2:00 — Effect of Three Different Plant Spacings in the Row on Yield and Ear Characteristis of Representative Single and Double Earing Sweet Corn Hybrids. Emil A. Wolf and Howard W. Burdine, Everglades Experiment Station, Belle Glade.

2:20 — Effects of Amine-type 2,4D Hormone Spray on Yield, Red-skin Color and Skinning of Red Pontiac Potatoes. E. N. McCubbin, Potato Investivations Laboratory, Hastings.

2:40 — Comparison of Broadcast and Fertility for Potatoes on Kana-

paha Fine Sand. John G. A. Fiskell and William K. Robertson, Agricultural Experiment Station, Gainesville.

3:00 — Summer Cover Crops in Potato Production. Donald L. Myhre, Potato Investigations Laboratory, Hastings.

3:20 — Panel — Gibberellins and Some Possible Uses for Them.

Moderator: F. S. Jamison, Agricultural Experiment Station, Gainesville.

Howard Teas, B. D. Thompson, M. H. Gaskins, and others, Agricultural Experiment Station, Gainesville.

4:20 — Sectional Business Meeting.

Wednesday Afternoon, October 30

2:00 — Five Year Summary of Fungicidal Control of Watermelon Foliage Diseases. N. C. Schenck and J. M. Crall, Watermelon and Grape Investigations Laboratory, Leesburg.

2:20 — Fungicides for the Control of Early Blight of Celery. John F. Darby, Central Florida Experiment Station, Sanford.

2:40 — Bionomics of the Southern Potato Wireworm, **Conoderus falli**, Lane. I. Life History in Florida. Dale M. Norris, Jr., Potato Investigations Laboratory, Hastings.

3:00 — Results of Experiments Conducted During the 1956-57 Growing Season for the Control of the Cabbage Looper. John W. Wilson, D. O. Wolfenbarger, R. M. Baranowski, W. G. Genung, and Dale M. Norris, Jr., Florida Agricultural Experiment Station.

3:20 — Symposium — Vegetable Insect Resistance to Insecticides in Florida. Moderator: James E. Brogdon, Agricultural Extension Service, Gainesville.

Reports:

A—The Nature and Development of Insect Resistance to Insecticides. Dale M. Norris, Jr., Potato Investigations Laboratory, Hastings.

B—Ineffective Control of Some Insect Pests in States Outside of Florida. D. O. Wolfenbarger, Sub-Tropical Experiment Station, Homestead.

C—Vegetable Insect Resistance in Florida. W. G. Genung, Everglades Experiment Station, Belle Glade.

D—Other Causes of Poor Control Sometimes Attributed to Resistance. E. G. Kelsheimer, Gulf Coast Experiment Station, Bradenton.

E—What Should Be Done About the Resistance Problem? John W. Wilson, Central Florida Experiment Station, Sanford.

Thursday Morning, October 31

9:00 — Chemicals Which Act as Combination Herbicides, Nematocides and Soil Fungicides. I. Effect on Field Seeded Tomatoes. D. S. Burgis and A. J. Overman, Gulf Coast Experiment Station, Bradenton.

9:20 — Chemicals Which Act as Combination Herbicides, Nematocides and Soil Fungicides: II. Effect on Soil Microorganisms. A. J. Overman and D. S. Burgis, Gulf Coast Experiment Station, Bradenton.

9:40 — Chemical Weed Control in Pole Beans and Tomatoes. D. S. Burgis, Gulf Coast Experiment Station.

10:00 — Bush Snap Bean Variety Trials on Sandy Soils of the Lower East Coast. H. Y. Ozaki, Plantation Field Laboratory, Ft. Lauderdale.

10:20 — Row Orientation and Its Relationship to the Growth and Certain Soil Factors. C. F. Eno, Florida Experiment Station, Gainesville, and P. J. Westgate, Central Florida Experiment Station, Sanford.

10:40 — Soil Soluble Salts — Determination of and Association With Plant Growth. Carroll M. Geraldson, Gulf Coast Experiment Station, Bradenton.

11:00 — Irrigation Experiment With Tomatoes on A Rockdale Soil. John L. Malcolm, and Roy W. Harkness, Sub-Tropical Experiment Station, Homestead.

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KROME MEMORIAL SECTION

Paul L. Harding, Vice President Presiding

Tuesday Afternoon, October 29

2:00 — A Report of the Florida Mango Forum Activities for 1957. R. Bruce Ledin, President, Florida Mango Forum, Sub-Tropical Experiment Station, Homestead.

2:15 — Volatile Materials from Avocados, Mangos, Limes, and Grapefruit. Paul L. Davis, USDA, Orlando.

2:30 — "Soft-Nose", a Physiological Disorder in Mango Fruits. T. W. Young, Sub-Tropical Experiment Station, Homestead.

2:50 — **Musa paradisiaca** L., Variety Radja. J. J. Ochse, University of Miami, Coral Gables.

3:05 — The Use of Starch Content in Determining Maturity of Florida Mangos. John Popenoe and William G. Long, USDA, Miami.

3:25 — Effect of Gibberellic Acid on Mango Fruit Set as Well as Other Tropicals. Manley Boss, University of Miami, Coral Gables.

3:40 — Rejuvenation of Old Mango Groves by Hedging or Top-Working to New Varieties. W. W. Carmichael, W. W. Carmichael Groves and Nurseries, Miami.

4:00 — Sectional Business Meeting.

Wednesday Afternoon, October 30

2:00 — A Report of the Lime and Avocado Activities for 1957. Hugh C. Whelchel, Assistant County Agent, Dade County, Homestead.

2:10 — Control of Variability in the Esmirelda Pineapple. Scott U. Stambaugh, Miami.

2:25 — The Relation of Maturity to Certain Chemical and Physical Characters in Florida Avocados. Thurman T. Hatton, Jr., John Popenoe, Mortimer J. Soule, Jr., and Paul L. Harding, USDA, Miami.

2:35 — Iron Deficiency in Avocados. Roy W. Harkness and J. L. Malcolm, Sub-Tropical, Experiment Station Homestead.

2:55 — Test Work on Some Sub-Tropical Fruits and Ornamental Plants in Connection with the Mediterranean Fruit Fly. D. O. Wolfenbarger, Sub-Tropical Experiment Station, Homestead.

3:05 — Cleft Grafting Grapes with Polyethylene and Sphagnum Moss. Loren H. Stover, Watermelon and Grape Investigations Laboratory, Leesburg.

3:20 — Commercial Potential of Yucca Elephantipes. M. L. Boss and J. J. Ochse, University of Miami, Coral Gables.

3:35 — Leaf Analysis of Avocado on N, P, and K Studies. M. L. Boss, and Seymour Goldweber, University of Miami, Coral Gables.

3:50 — Trials with **Swinglea glutinose** as a Rootstock for Citrus. Frank D. Venning, U. S. Operations Mission Havana, Cuba.

3:55 — Avocado Maturity-Marketing Agreement. William H. Krome, Chairman, Sub-Committee on Maturity, Avocado Administrative Committee, Homestead.

Thursday Morning, October 31

9:00 — A Report of the Rare Fruit Council Activities for 1957. William F. Whitman, President, Rare Fruit Council, Whitman Properties, Miami Beach.

9:20 — New Developments in Lychee Marketing. Gordon Palmer, President, Florida Lychee Growers Association, Palmer Nurseries, Osprey.

9:40 — Persian Limes Growing in the Ridge Section of Florida. William F. Ward, Ward's Nursery and Groves, Avon Park.

9:55 — Okinawa Peach Shows Promising Resistance to Root-knot Nematodes. R. H. Sharpe, Agricultural Experiment Station, Gainesville.

10:10 — Effect of Nitrogen and Timing of Applications on Persian Limes. S. John Lynch and Seymour Goldweber, University of Miami, Coral Gables.

10:25 — Pollinating Insects on Lychee Blossoms. F. G. Butcher, University of Miami, Coral Gables.

10:40 — Observations on the Advertising of Speciality Fruits. Charles

F. Ivins, Manager, Florida Avocado and Lime Commission. Homestead.

11:10 — A Leaf Beetle Feeding on the Stems of Lychee. George Wallace Dekle, State Plant Board, Gainesville.

11:25 — **Mimosa invisa** var. **Inermis.** J. J. Ochse, University of Miami, Coral Gables.

11:35 — The Macadamia in California. William Bickneal Storey, Citrus Experiment Station, Riverside, Calif.

* * *

PROCESSING SECTION

James M. Bonnell, Vice President Presiding

Tuesday Afternoon, October 29

2:00 — Reminiscences of Early Work in Citrus Fruit Technology. Seth S. Walker, Thornton Laboratories, Inc., Tampa.

2:20 — Five-Year Storage of Frozen Concentrated Orange Juice at −4 degrees, −5 degrees and 10 degrees F. Theo. J. Kew, U. S. Citrus Products Station, Winter Haven.

2:40 — Factors to Consider in Determining Clarification in Frozen Orange concentrates. C. D. Atkins, Florida Citrus Commission; A. H. Rouse, Citrus Experiment Station; and E. L. Moore, Florida Citrus Commission, Lake Alfred.

3:00 — Some Specific Sources of Contamination in Processing Frozen Concentrated Orange Juice. D. I. Murdock, and Charles H. Brokaw, Minute Maid Corp., Plymouth.

3:20 — A Story of the Degrees Brix and Brix-Acid Ratio of Oranges Utilized by Florida Citrus Processors for the Seasons 1952-53 through 1956-57. Geo. F. Westabrook and E. C. Stenstrom, Citrus and Vegetable Inspection Division, State Dept. of Agricultural, Winter Haven.

3:40 — Citrus Vitamin P. II. The Antibiotic Activity of Citrus and Bio-Flavanoids. Boris Sokoloff, Morton Biskind, William C. Martin, Clarence C. Saelnof, Shiro Kato, Akira Kato, Taekyung Kim, Maxwell Simpson and George Renninger, Southern Bio-Research Laboratory, Florida Southern College, Lakeland.

4:00 — Chemical Analysis of Citrus Bio-flavanoids. R. Hendrickson and J. W. Kesterson, Citrus Experiment Station, Lake Alfred.

Wednesday Afternoon, October 30

2:00 — Composition and Organoleptic Evaluation of Portions of Celery Stalk. Chesley B. Hall, Agricultural Experiment Station, Gainesville.

2:20 — Preparation of Celery Juice from Florida-Grown Celery. R. A. Dennison and M. W. Hoover, Agricultural Experiment Station, Gainesville.

2:40 — Preliminary Studies on the Utilization of Cull Tomatoes. M. W. Hoover and R. A. Dennison, Agricultural Experiment Station, Gainesville.

3:00 — Effect of Wetting and Top Icing Upon the Quality of Vacuum Cooled Sweet Corn. R. K. Showalter, Agricultural Experiment Station, Gainesville.

3:20 — Processing Studies with Florida Sweet Corn. I. Yield of Cut Corn. M. W. Hoover and R. A. Dennison, Agricultural Experiment Station, Gainesville.

3:40 — New Aspects for Processing Sweet Potato Products. Julian C. Miller, Louisiana State University, Baton Rouge, La.

4:00 — Trends in Production and Handling of Green Beans and Tomatoes for Processing. Jesse M. Huffington, Continental Can Co., Baltimore, Md.

4:20 — Pregelation in Bitter Orange Marmalade Bases. A. H. Rouse, Citrus Experiment Station and C. D. Atkins, Florida Citrus Commission, Lake Alfred.

Thursday Morning, October 31

9:00 — Trends in the Production of Limes for Processing. L. L. Chandler, Grower, Goulds.

9:20 — Preliminary Studies on Cooling Florida Citrus Prior to Packing. W. Grierson, Citrus Experiment Station, Lake Alfred.

9:40 — Cost Advantage of Bulk Handling Through the Packing House. R. V. (Red) Phillips, Haines City Citrus Growers Association, Haines City.

10:00 —

10:20 —

10:40 — Effect of Date of Packing on Quality of Canned Grapefruit Sections. R. L. Huggart, Florida Citrus Commission; F. W. Wenzel, Citrus Experiment Station; and E. L. Moore, Florida Citrus Commission, Lake Alfred.

11:00 — "Mrs. Smith Goes Shopping." Robt. C. Brink, Kroger Food Foundation, Cincinnati, Ohio.

* * *

ORNAMENTAL SECTION

S. A. Rose, Vice President Presiding

Tuesday Afternoon, October 29

2:00 — Nitrogen and Potassium Fertilization of Potted Chrysanthemums. S. S. Woltz, Gulf Coast Experiment Station, Bradenton.

2:20 — Nematodes Affecting Florida Chrysanthemums and Their Control. E. G. Kelsheimer and A. J. Overman, Gulf Coast Experiment Station, Bradenton.

2:40 — The Possible Use of Gibberellins as a Substitute for Artificial Light in Growing Chrysanthemums. Benjamin Wolf, Hollywood.

3:00 — Hybrid Sansevierias Suitable for Ornamental Use. James Pate, Fiber Crops Div., Belle Glade.

3:20 — Stem End Rot of Dieffenbachis. L. A. McFadden, Sub-Tropical Experiment Station, Homestead.

3:40 — A New Fungicide for Controlling Fusarium Diseases. R. O. Magie, Gulf Coast Experiment Station, Bradenton.

4:00 — Sectional Business Meeting.

Wednesday Afternoon, October 30

2:00 — Chemical Modification of Ageotropic Bending of Snapdragons. H. J. Teas and T. J. Sheehan, Agricultural Experiment Station, Gainesville.

2:40 — Soil Fumigation in Controlling Gladiolus Stromatinia Disease. R. O. Magie, Gulf Coast Experiment Station, Bradenton.

3:00 — Photo and Chemical Induction of Flowering in Chrysanthemums. T. J. Sheehan and H. J. Teas, Agricultural Experiment Station, Gainesville.

3:20 — Further Studies of the Phytotoxicity of Pesticides. S. H. Kerr and E. W. McElwee, Agricultural Experiment Station, Gainesville.

3:40 — A prospetus of Commercial Cut-Flower Production of Roses in Florida. S. E. McFadden, Agricultural Experiment Station, Gainesville.

Thursday Morning, October 31

9:00 — Amaryllis Flowering. T. J. Sheehan, Agricultural Experiment Station, and K. J. Howe, College of Agriculture, Gainesville.

9:20 — Orchid Diseases. H. C. Burnett, State Plant Board, Gainesville.

9:40 — Effect of Propagation Media and Dip Treatment on Rooting Cuttings of Dogwood, East Palatka Holly, and Formosum Azalea. R. D. Dickey, Agricultural Experiment Station, Gainesville.

10:00 — Some Recent Developments in Diseases of Ornamental Plants. D. C. Coe, Agricultural Extension Service, Gainesville.

10:20 — Control of Pythium Root-Rot of Chinese Evergreen with Soil Fumigants. H. N. Miller, Agricultural Experiment Station, Gainesville.

Conservation practices have been applied to more than three million acres of Florida cropland since the inspection of soil conservation districts in the state in January 1938. These include crop rotation, contouring, cover cropping, green manuring, mulch tillage and strip-cropping.

GROWER'S OWN PAGE

LONE LADY DEVELOPS OWN CITRUS GROVE

(Continue from page 5)

finally established a system. I attached my metal trailer to the tractor. A hundred pounds of fertilizer was too heavy for me to lift in to the trailer so I split the bag in half. I'd park the trailer in the fourth row in the center of the grove. By the time the container was empty I would be back to the trailer where I would fill it up and start on the next row. When four rows were completed, I'd move the tractor down four more rows. After I'd finish fertilizing all the trees, I'd start out again at the beginning with my scuffle hoe. Each tree would then have all the fertilizer haked in. I kept the grove free of cover crops for I still had a horrow of finding Pangola roots coming thru but after watching closely for a year and a half, I found out I really had killed it all.

During the spring, I began to lose trees. I had my fertilizer man come out and check but he didn't know what was causing the trees to die. I was faithful in putting on a certain weight of fertilizer for each tree as he had cautioned me. We had the soil analyzed but still couldn't find the reason for them to die. I bought more trees and planted them myself. After replacing about a hundred I quit. One day while driving the tractor over the grove checking all the trees, I noticed one nice size tree that didn't look too well so I got down on my knees and started to pull away the soil from he soil line. I found termites by the hundreds eating the bark. Then I started and from front to back, I travelled every tree on my hands and knees with a bag of chlorodane. I dug away all dirt from the trunks and applied a heavy coating of the dust. I found termites in about 40 trees so every month, I'd check all trees and when the second winter came along, I added chlorodane to every tree before they were hilled. The next spring I again started to fertilize every six weeks and hoed it all in. I had no help at all with the exception of my ten year old grandson who drove the tractor for me when I pu in a cover crop. I rigged a seat on the disk and added a long wide roll of hog wire to the disk so as I threw out the seed by hand, the disk dug it in and the drag

(Continued on page 26)

Hoe 4 trees a minute...

with New POUNDS Grove-Hoe

Case 300 Tractor with Pounds Grove-Hoe

The new revolutionary Pounds Grove-Hoe tills and fertilizes 4 trees a minute. Owners report

The tilling rotor works the ground thoroughly for good aeration and moisture intake. Rotor can be set to till as shallow as ½ inch near the root crowns . . . as deep as 4 inches away from the tree. Tractor creeper gear permits excellent work even in Bermuda. Constant PTO allows stationary working of humps of grass, leaving land practically level.

Fertilizer applied ahead of the rotor is thoroughly worked into the soil. Rate of application is ½ to 6 pounds per tree. Automatic control shuts off fertilizer when you raise the hoe for transport. Get full information from the manufacturer or any of the J. I. Case dealers listed below.

Gentlemen:

"I can hoe 1000 to 1200 trees per 10-hour day. Hoed 50,000 trees from September through December '56.

"Busting crust is a big feature—aerates soil, leads moisture to roots. Doesn't cut crownroots—shallow at base of tree, 2 ½ to 4 inches at the tree's water shed.

"I followed a rotary cutter in tall Johnson Grass. Hoe thoroughly chewed up stubble and roots.

"You can just hoe around the tree, leave weeds or cover crop between tree rows to control wind erosion."

R. J. Patrick

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Reducing Losses In Harvesting And Handling Tangerines

DR. W. GRIERSON
FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

Reprinted from Volume 69 of the Proceedings of the Florida State Horticultural Society, Orlando, November 7, 8, & 9, 1956.

Previous studies (3, 4) on the handling of tangerines have shown that ethylene degreening tended to increase stem-end rot and also sensitized the tangerines towards certain types of mechanical injury. In order to study these effects more closely, tangerines were separated after picking into several categories according to color, each category being handled separately through the Experiment Station packing house. The next logical step was to spot-pick into the various color categories. This was done in 1954-55. It was found that decay was least in tangerines picked full color and not degreened. Decay was excessive in tangerines picked without a good color break and heavily degreened. Severe peel injury occurred to fully colored tangerines when they were subjected to the ethylene degreening process, as would normally be the case when mixtures of green and naturally colored fruit are handled together.

Methods

Seven pickings were made between November 4 and November 29, 1955. At each picking the tangerines were separated by the pickers into three color categories: e.g. "A", good orange color break; "B", yellow color break; "C", little or no color break. The fruit from each of the "A" and "B" categories were divided into two lots, each consisting of 100 fruit. One lot was held in the degreening room as long as the greenest fruit (Group "C") were in there, which is what happens in commercial practice. The duplicate lots within the "A" and "B" categories were removed from the degreening room as soon as they were considered to be degreened to an extent equivalent to commercial practice. After degreening, the various samples were washed, polished, waxed and stored at 70° F. for decay studies. They were examined at one, two and three weeks from date of picking, separate records being kept of stem-end rot, blue and green molds and peel injuries.

A further study was carried out which (except for the first two replications) used these same pickings of tangerines. Since it had been found previously that degreening sensitized tangerines to handling injury, particularly by the polisher brushes (4), additional samples were picked to provide further information on this point. These additional samples were washed and polished before degreening. Although not advocated for commercial practice, this provided a comparison with the samples receiving the normal treatment of washing and polishing after degreening. All samples were waxed prior to storage at 70° F. Since the prior washing and polishing impedes degreening, these samples were removed from the ethylene treatment at the same time as the regular samples, regardless of their color.

The color of samples was determined by use of the visual comparison colorimeter as developed by Rouse and Bowers (8) from an original design by Baier and Ramsey (1). In this apparatus the reflected light from the surface of the sample is focused on a ground glass plate for comparison with Munsell color plates (7).

Results

Color at Picking and Subsequent Decay—Table 1 shows the total losses from all causes presented as the averages of the seven replications. Table 2 presents total losses for one examination period and one treatment in greater detail. A statistically significant increase in losses with advancing picking dates was found. The same relationship prevailed in the 1954-55 experiments. Returning to Table 1, it will be noted that differences are very minor at the first examination. At the second week from picking, differences in decay between lots receiving different degreening periods are still not discernible, but losses in the "B" group are about twice those in the "A" group. At three weeks from picking the losses in the "B" group (medium to poor color break) are still considerably higher than in the well colored, "A", group. This is in line with the findings reported previously (4). Two other results are in marked contrast to the 1954-55 results. The losses in the tangerines picked with an excellent color break were not increased by a protracted degreening period. It is felt that this is understandable in view of the extremely dry season which caused a sharp reduction in stem-end rot but had

Table 1: Total losses (all causes) in tangerines spot, picked for color between Nov. 4-29, 1955 and held after degreening at 70° F.

Treatment	Holding period*	Total percent losses (averages of 7 pickings) Best possible color break (A)	Medium to poor color (B)	Little or no color break (C)
Minimum degreening period				
	1 week	6	6	—
	2 weeks	14	24	—
	3 weeks	26	40	—
Full degreening period				
	1 week	3	6	6
	2 weeks	11	26	24
	3 weeks	30	50	50

* All times are from date of picking.

little if any effect upon Penicillium (blue and green molds). Since stem-end rot is stimulated by the ethylene used in the degreening process (3) and Penicillium is sharply checked by the 85° F. degreening temperature (6) the effect of such differences is readily apparent. The other difference from the 1954-55 results was that the losses from peel injury and decay in the "C" group (picked green) was no higher than in the "B" group (medium to poor color break). In the experiments of the previous season the "C" group tangerines had broken down almost completely. In the current experiments losses were no higher than in the "B" group, but this fruit would have been largely unmarketable on the basis of grade. Table 3 shows the average colors of the various samples after degreening. On the scale used, a sample that averages "10" can (as far as color is concerned) pack out almost entirely No. 1. Samples rating higher than "20" on this scale could hardly be considered for packing as No. 1, and lower grades than No. 1 were not allowed to be shipped during the period over which this experiment was conducted (2).

Ethylene Degreening and Subsequent Peel Injury—The result of the experiments on the effect of ethylene on subsequent peel injury are shown in Table 4. This form of peel injury takes the form of "zebra" markings as described previously (4) and had previously been noted to a great extent in samples that had been degreened and subsequently dried in a polished drier. In Table 4 it will be noted that this peel injury appeared in very considerable amounts in only three of the six pickings. In two it was virtually absent and in the sixth appeared to a very slight extent. In the three severe outbreaks, it was very much more pronounced in the samples that had been degreened before washing and drying rather than after, thus confirming the hypothesis that ethylene degreening can, in some way, sensitize tangerines to handling damage that shows up as "zebra skin" peel injury.

Fig. 1 illustrates a possible explanation of why this effect showed in only three of the six replications. Comparing the rainfall record with the incidence of peel injury it can be seen that all those samples in degreening caused increased peel injury were picked three to five days which washing and polishing after after heavy rains. Those samples in which degreening did not cause sensitivity to such damage were picked 11 to 19 days since the last heavy rain.

DISCUSSION

It is considered that the studies on spot-picking for color have a very direct application to commercial tangerine handling. Many packers spot-pick for size and some of the more exacting operators delay picking until color break is reasonably advanced. Despite this, altogether too many tangerines leave the packinghouses as "eliminations." In the 1955-56 season poor color break, almost entirely failed to "color up" to the extent needed for a No. 1 pack. During the month of November, No. 2 tangerines could not be shipped (2) and the cannery price for "eliminations" was 35 to 40c per box. Taking the cost of growing tangerines as 85c per box (9), picking and hauling as 75c (10) and estimating the cost of degreening and handling through the packinghouse as 10c, then the out-of-pocket expenses on these eliminations was $1.70. Thus almost every box of green tangerines picked throughout the course of this experiment would have represented a loss of $1.30-$1.35. If these fruit had been left on the tree they would have been saleable fruit. Many of them were possibly off-bloom and if harvested later would have been available for a premium market. A double spot-picking of early

(Continued on page 17)

Table 2: Total losses (at two weeks from picking) in tangerines picked in three color categories, all of which were given the same degreening period. Degreening considered to be equivalent to that used in commercial practice.

Date (all 1955)	Good orange color break (A)	Yellow color break (B)	Full green (C)	Degreening period (hours)
	Percent	Percent	Percent	
Nov. 4	2	2	10	72
Nov. 7	6	8	6	70
Nov. 9	10	19	12	68
Nov. 14	11	23	38	66
Nov. 15	13	45	25	91
Nov. 21	13	35	27	46
Nov. 29	20	48	48	76
Averages	10.7%	25.7%	23.7%	69.3 hrs.
L. S. D. (5% Level) - - - - - 14.71				
Analysis of Variance="F" values		For color categories 6.78 *		
		For picking dates 6.59 *		

* Significant at the 5% level.

Table 3: Final colors* after degreening. Same fruit and experiments as Table 1.

Date (1955)	(A)	(B)	(C)
Nov. 4	15	20	45
Nov. 7	10	15	30
Nov. 9	10	40	40
Nov. 14	15	15	35
Nov. 15	15	20	35
Nov. 21	5	25	40
Nov. 29	5	15	40
Averages	10.7	21.4	41.4

* Colors are from an arbitrary scale on which "0" is deep reddish orange and "100" is dark green. "Average color" is determined by means of the visual comparison colorimeter developed by Rouse and Bowers (8).

Table 4: Effect of Washing and Polishing Before and After Degreening on Peel Injury of Tangerines.

Picking Date (1955)	* Color Category	Percent Tangerines Unmarketable Due to Peel Injury: 1 week @ X	1 week @ Y	2 weeks X	2 weeks Y	3 weeks X	3 weeks Y
Nov. 1	Unsorted	0	15	7	37	4	34
Nov. 9	A	0	0	0	1	0	1
	B	0	0	2	0	5	0
	C	0	0	1	1	1	2
Nov. 14	A	0	47	0	50	0	51
	B	0	32	0	32	0	32
	C	1	23	1	23	1	27
Nov. 15	A	10	38	10	40	10	40
	B	27	52	30	56	34	56
	C	9	36	13	36	13	36
Nov. 21	A	0	0	0	0	12	0
	B	0	0	0	0	6	0
	C	0	1	0	1	0	1
Nov. 29	A	0	1	0	1	0	1
	B	5	0	9	1	9	1
	C	12	2	12	4	12	4
Averages		4.0	15.4	5.3	17.7	6.7	17.9

* Color categories are identical with those in Tables 1, 2, and 3.
@ Times of examinations are as from picking date.
"X" Washed and polished before degreening.) Both waxed with Flavorseal prior
"Y" Washed and polished after degreening.)

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SMATHERS TO ADDRESS GROWERS CONVENTION

SENATOR SMATHERS

Senator George A. Smathers will address the 14th Annual Convention of the Florida Fruit & Vegetable Association.

Senator Smathers will be the principal speaker at the annual banquet of the Association on October 10th, at Hotel Fontainebleau, Miami Beach, according to an announcement by Roy Vandegrift, Jr., Pahokee, general chairman of the Convention.

"Of interest to the growers and shippers of Florida vegetables and tropical fruits is Senator Smathers' support of important legislation for the industry such as his successful sponsorship of the bill to insure truckers of vegetables and fruit crops the right to lease their equipment on return trips from Northern markets," said Vandegrift.

"Also of particular interest in this area is his work on the development of inter-American tourism.

"Senator Smathers was graduated from the University of Florida Law School in 1938 after serving as president of the University student body. He immediately entered the practice of law and in 1929 was appointed assistant district attorney at Miami. He was elected to the Senate in 1950.

"It is a real privilege for this Association to be able to present Senator Smathers to our members and guests," concluded Vandegrift.

With the help of a harmless form of blackhead parasite, USDA researchers are learning more about the harmful strain that causes blackhead in turkeys.

REDUCING LOSSES IN HANDLING AND HARVESTING TANGERINES

(Continued from page 14)

tangerines for size and color would involve a higher than normal picking cost, but this would be cheaper than picking green tangerines for a $1.30 loss.

Decay studies showed that, in two successive years, decay increased as the season advanced. This decrease in keeping quality was not related to the length of the degreening period, nor to rainfall. Since the two seasons' pickings terminated on December 13, 1954 and November 29th, 1955, respectively, it is not considered that the increased losses were due to "overmaturity" in any normal use of the term.

The studies on the relationship between ethylene treatment and the "zebra skin" peel injury indicates that the previously observed sensitizing of the fruit due to ethylene degreening is a genuine phenomenon but is in some way linked to rainfall, since the effect was found only in those samples picked within five days of the last heavy rain. Commercially it is not possible to avoid this damage by washing and polishing prior to degreening as such action drastically slows up ethylene degreening (5). It is however suggested that such losses might be minimized by curtailing degreening as much as possible in the periods after heavy rains.

Summary

A spot-picking program was carried out for tangerines throughout the month of November 1955. The tangeines were separated into three color categories which were handled separately throughout the experiments.

It was found that decay in tangerines picked with a good orange color break was about half that in tangerines picked with a poor color break or no color break at all.

Final color in tangerines picked too green and degreened with ethylene was so poor that it is unlikely that they could have packed enough No. 1 fruit to pay for cost of handling. The balance of this fruit would have had to be sent to the cannery or abandoned, the loss in either case being at least $1.30 per standard box of "packinghouse eliminations."

A distinctive form of peel injury, often known to the trade as "zebra skin" occurred in three pickings that were harvested three to five days after heavy rain. This form of injury was greatly aggravated when such tangerines were polished subsequent to ethylene degreening.

It is recommended that early tangerines be closely spot-picked for color-break as well as for size.

LITERATURE CITED

1. Baier, W. E., Ramsey, H. J. et al. 1932. Coloring citrus fruit. Bulletin, California Fruit Growers Exchange.
2. Daily Market Bulletin Nov. 29, 1955, No. 41. Florida Citrus Mutual, Lakeland, Florida.
3. Grierson, W. and W. F. Newhall. 1955. Tolerance to ethylene of various types of citrus fruit. Proc. Am. Soc. Hort. Sci. 65: 244-250, June.
4. _____ and _____. 1956. Reducing losses in ethylene degreening of tangerines. Proc. Am. Soc. Hort. Sci. 67: 236-243, June
5. _____ and _____. 1956. Degreening of citrus fruits. Ann. Rept., Fla. Agr. Expt. Stn. (186-188).
6. Hopkins, E. F. and K. W. Loucks. 1948. A curing procedure for the reduction of mold decay in citrus fruit. Fla. Agr. Expt. Stn. Bull. 450.
7. Munsell Book of Color. Munsell Color Co., Inc. 10 East Franklin St., Baltimore 2, Maryland.
8. Rouse, A. H. and J. C. Bowers. 1951. Packinghouse Research. Fla. Citrus Expt. Stn. Lake Alfred, Prog. Rept. Project 671.
9. Savage, Z. 1952. Profitableness of oranges, Temples and tangerines, 1945-50. Citrus Magazine 15 (4), 16-17, Dec.
10. Spurlock, A. H. 1956. Costs of picking and hauling Florida citrus fruits 1954-55 season. Univ. of Fla. Agr. Econ. Mimeo Rept. 56-6.

The 1957 turkey crop is expected to top the record number of 77 million birds raised in 1956, says the USDA. Even if July and August hatchings are below the 1956 level, hatchings for the year (September 1956 - August 1957) seem likely to exceed a year earlier.

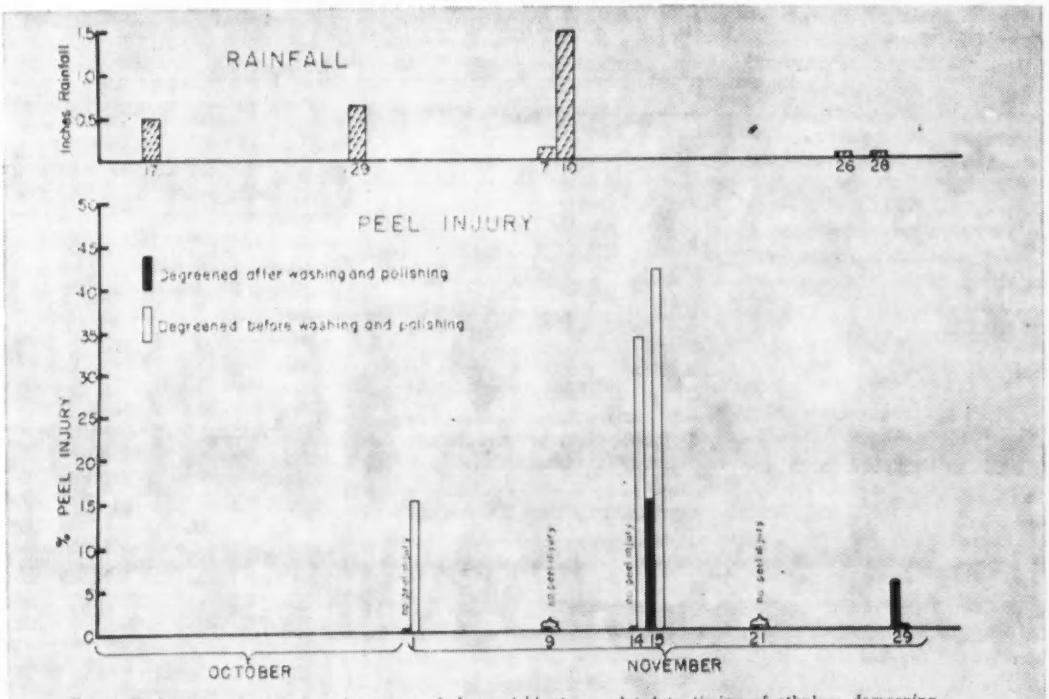

Fig. 1. Peel injury of tangerines (at one week from picking) as related to timing of ethylene degreening and to rainfall.

How To Buy . . . An Irrigation System

ASAE TENTATIVE STANDARD
Approved January, 1957
Sprinkler Irrigation Technical Data Sheet*
Farm Information

Name of Owner .....
Address ..... Date .....
Section ..... Range .....
Township ..... County .....
State .....

IRRIGATION SYSTEM DESIGN AREA:

Topography—Include profile of proposed main pipeline locations. Give elevations of points around field boundaries, water level, pump locations, highest and lowest points in design area, and natural gas or electrical power line location.

Soils—Show predominating soil types and location on map.

Available moisture-holding capacity ..... (in/ft)
Intake rate (in/hr)
Effective depth of soil (ft)

WATER SUPPLY

Source ..... Amount available ..... GPM .....
acre feet
Seasonal variation GPM .....
to GPM .....
Delivery scheduling .....

POWER SOURCE

Electrical ..... Internal combustion engine .....
Fuel type ..... Other .....
If electrical give power phase ..... Voltage ..... HP
Limitations .....

LABOR AVAILABILITY

Hours of operation per day .....
..... Operation days per week .....

IRRIGATION REQUIREMENTS DESIGN AREA

Crops
Field No.
Acres
Effective root zone
Dept, feet
Moisture to be replaced each irrigation,
Inches
Peak moisture
Use rate in
Per day
Peak use
Period
Irrigation
Frequency
Days

*This data sheet was developed by ASAE Sprinkler Irrigation Research Committee in cooperation with the Sprinkler Irrigation Association, U. S. Farm Home Administration and U. S. Soil Conservation Service.

PART II

S. E. DOWLING
ASST. EXTENSION AGRICULTURAL ENGINEER
U. OF F., GAINESVILLE
AT CITRUS GROWERS INSTITUTE CAMP McQUARRIE

DESIGN AND SPECIFICATION INFORMATION

SYSTEM CAPACITY REQUIREMENTS

Minimum system capacity ..... gpm
Application rate (in/hr) .....
Time of lateral operation per set (hrs) .....
Depth applied per set inches .....
Number of lateral sets per day (no.) .....
Operation period to cover area (days) .....
System capacity required gallons .....
Water application efficiency (percent) .....
Depth moistrue replaced each irrigation (inches) .....

Field Nos. 1 2 3 4 5

SPRINKLER SELECTION

Application rate ..... in per hr. Sprinkler spacing on lateral ..... ft.
Lateral spacing on mainline ..... ft. Sprinkler discharge ..... gpm
Diameter of circle covered ..... ft. Type ..... Nozzle sizes ..... x .....
Required operating pressure ..... psi

LATERAL DESIGN

Lateral spacing on mainline ..... ft. Sprinkler spacing on lateral ..... ft.
Lateral length ..... ft. Area covered per lateral setting ..... acres.
No sprinklers per yateral .....
Lateral discharge ..... gpm.
No. laterals required ..... to cover design area in ..... days.
Pipe size required: Length ..... ft. Diameter ..... in. Gage pipe .....
Length ..... ft. Diameter in. Gage pipe .....
Rise or fall (circle applicable condition) in lateral ..... ft.
Pressure loss in lateral due to friction ..... psi or ..... ft.
Pressure required (at mainline) to operate lateral ..... psi or ..... ft.

MAIN LINE DESIGN

Portable ..... or Permanent ..... Material: Steel ..... Aluminum ..... or other .....
of ..... in pipe ..... gage.
Mainline length ..... ft. Discharge capacity ..... gpm
Rise or fall (circle one) in mainline ..... ft.
Allowable head loss due to friction ..... ft.
Pipe sizes required ..... ft. of ..... in pipe ..... gage.
..... ft. of ..... in pipe ..... gage.
..... ft. of ..... in pipe ..... gage.
Head loss due to friction .....
ft. Outlet spacing on mainline ..... ft.

SUPPLY LINE DESIGN (that portion of mainline outside design area)

Supply line length ..... ft.
Discharge capacity ..... gpm.
Pipe size required ..... in.
Friction head loss ..... ft.

TOTAL DYNAMIC HEAD REQUIREMENTS

Pressure required at lateral ..... psi ..... ft.
Friction head loss in main line ..... psi ..... ft.
Friction head loss in supply line ..... ft.
Friction head loss on suction line ..... ft.
Elevation difference between pump and highest point of later line ..... ft.
Elevation difference between water source and center of pump ..... ft.
Miscellaneous friction head loss in special valves and fittings ..... ft.
Total ..... ft.

PUMP REQUIREMENTS
Capacity ..... gpm at head ..... ft. Size ..... in.

PUMP SPECIFICATIONS
Type ..... capacity ..... gpm.
Efficiency ..... % at ..... ft. head
Rpm at required discharge .....
Brake hp at required discharge .....

POWER REQUIREMENTS
Water hp ..... Efficiency ..... %. Brake hp .....
RPM .....

POWER UNIT SPECIFICATION
Type ..... Make .....
Model ..... Size .....
Continuous hp rating ..... at ..... rpm
Cu-in displacement .....
Stroke ..... in.
Piston speed at design load ..... Bmep at design load ..... psi.
Type of power conversion ..... Speed ration .....
Electric motor: Voltage .....
Phase ..... Rpm .....

ECONOMIC ANALYSIS OF IRRIGATION

SYSTEM COST

ITEM
Well unit .....
Pumphouse unit .....
Power unit .....
Pump unit .....
Power line extension ..... ft.
Main pipe line (complete with valves ..... ft.
Lateral pipe lines (complete ..... ft.
Sprinkler and risers ..... no.
Special equipment
List .....
Total Material Costs .....
Cash outlay for installation .....
Farm costs, Labor .....
Tractor use .....
Other .....
Total Farm Costs .....
Total Cost
Quantity and Unit
Unit cost, dollars
Total cost, dollars
Annual Fixed Cost

LABOR COSTS
Moving laterals (per irrigation ..... hrs.
Moving mainline (per irrigation) ..... hrs.
Starting and stopping pump (per irrigation ..... hrs.
Other time required (per irrigation ..... hrs.
Total labor (per irrigation ..... hrs.
Seasonal cost = Cost per irrigation ..... x No. of irrigations .....

INVESTMENT COST
Water development—(well, pond sump, etc.) ..... $_____
Land development — (leveling, clearing) ..... $_____
Equipment ..... $_____
Materials ..... $_____
Labor ..... $_____
Other—(rights of way, legal and techincal costs ..... $_____
Total Investment ..... $_____

ANNUAL FIXED COSTS
Annual depreciation of investment ..... $_____
Interest on average investment ..... $_____
Taxes — (irrigation equipment ..... $_____
Insurance ..... $_____
Total fixed cost ..... $_____

ANNUAL OPERATING AND MAINTENANCE COST
Hours of operation per year .....
Fuel or electricity ..... $_____
Lubricating oils, grease, attendance ..... $_____
Labor, irrigating ..... $_____
Maintenance irrigation system ..... $_____
Total operating and maintenance costs ..... $_____
Total cost of irrigation = Fixed cost plus operating and maintenance costs ..... $_____
Cost per acre inch = Total cost of irrigation divided by total acre inches applied ..... $_____
Cost per irrigated acre = Cost per acre inch multiplied by inches applied ..... $_____
Remarks: .....
Made by .....
Title .....
Date .....

$$cu = 100\ (1.0 - Ex)/MN$$

Where x = deviation of individual observation from the mean value M.

N = number of observations.

Another formula which is identical to the uniformity coefficient formula above, has been proposed by Vaughn E. Hansen, Professor of Irrigation and Drainage Engineering, Utah State University, Logan, Utah. This Water Distribution Efficiency formula is as follows:

W.D.E. = 100 (1 - average deviation)

$$\text{or } Ed = 100\ (1 - Y)\ \text{average depth applied}/D$$

Where Ed = water distribution efficiency

y = average numerical deviation in depth of water stored from average depth stored during the irrigation

d = average depth of water stored during the irrigation

The product of the water distribution efficiency and the initial application efficiency would give the overall application efficiency by which a system could be designed.

After considering the uniformity of the sprinklers and other factors, such as the intake rate of the soil and evaporation and wind drift losses, the design engineer can select the proper sprinkler and spacings for the system to be designed.

The size of the lateral line is determined by the fact that it is not economical for the loss in pressure to be more than 20% of the operating pressure at the sprinkler head. For example, if the sprinkler is to operate at 50 PSI, then the allowable friction loss between the first and last sprinkler on a given lateral should not be over 10 PSI. If the fraction loss is greater than this allowable 20%, the size lateral line must be increased, or at least enough larger size pipe used to reduce the friction loss total in the lateral to an amount that is less than the allowable 20% or the 10 PSI in the example.

Ordinarily on short laterals of 660 feet or less, having two sizes of pipe, presents a handicap in moving and keeping the sizes separate. For this reason sprinkler lines are normally over 660 feet in length before it is economical to have two different size pipes in the line.

Always remember that the smaller the loss the more uniform the application.

One of the methods that should be emphasized is that of selecting the most economical size mainline. It is possible to pump a given

(Continued on page 27)

Problems Related To Production And Distribution Of Cartoned Orange Juice

DAVID O. HAMRICK
QUALITY CONTROL DIRECTOR
FRUIT INDUSTRIES, INC.,
BRADENTON
AT CITRUS GROWERS INSTITUTE

Scope And Importance

Cartoned, or chilled orange juice as it is commonly called, is single strength orange juice which is marketed in a waxed fiberboard carton. It is prepared and treated in such a manner as to retain most of the flavor and aroma which is associated with freshly extracted orange juice. As a result it is quite perishable in nature and must be maintained under adequate refrigeration in order to reach the ultimate consumer in a palatable form. It is now produced by more than twenty processing firms in the State of Florida and marketed under more than seventy trade names or labels. In addition to the Florida producers there are several firms in the State of California producing a similar product for distribution on the West Coast. Chilled, or cartoned, orange juice produced in the State of Florida is distributed throughout the United States as far North as Canada and as far West as Oklahoma City. During the 1954-55 season it was estimated that approximately 3,000,000 boxes of oranges were used in the production of cartoned orange juice and in the 1955-56 season there were approximately 3,500,000 boxes of oranges used. According to figures released by the Florida Canners' Association there had been 4,857,560 boxes of oranges used in the production of cartoned orange juice from the start of the 1956-57 season up until the week ending July 13, 1957. This tremendous increase is even more marked when it is remembered that his figure does not include the oranges which go into the frozen concenrated orange juice which is used as the summer supply of cartoned orange juice by many of the cartoned orange juice producers. It is anticipated by the staistical section of the Florida Canners' Associateion that nearly 8,000,000 boxes of Florida oranges will find their way into cartoned orange juice before the end of the current season. Producers of this product range in size and investment from large citrus pocessing firms, which have been well established in other citrus products for years, to small operators who have only two extracting machines and some used dairy equipment as a physical plant. Distribution ranges from large fleets of privately owned refrigerated trucks to once a week shipping schedules by a chartered refrigerated van.

Under current regulations issued by the Florida Citrus Commision, the product may be produced from freshly extracted whole orange juice which has been treated in any acceptable manner to reduce the number of viable bacteria and to stabilize the enzymatic activity of the juice. It may be made from frozen single strength orange juice, from reconstituted frozen concentrated orange juice, or from a combination of any of the above items. Methods of current production will be discussed later in this paper. The growth of this segment of the citrus industry has been so rapid in the last two or three years that it has attracted enough attention to cause serious minded individuals in the industry to begin consideration quality regulations which would protect the consuming public against inferior juice, and would protect the processor against unfair competition from orangeades. In March of 1955 the Florida Citrus Commission issued its first set of regulations governing the production of chilled orange juice and the labeling of the product. In June of 1955 these regulations were amended to ease the production restrictions established earlier. In both cases the action was taken after careful study of the situation and after industry meetings were held in which interested parties representing the citrus processing firms were heard. In December 1955 the United States De-

partment of Agriculture issued notice of a proposed federal grade standard for chilled orange juice. At the present time these proposed federal grade standards are still under consideration but there is every indication that in the near future there will be grade standards for this product similar to the ones for other processed citrus products.

In addition to the proposed U.S.D.A. grade standards, the United States Food and Drug Commission is actively considering a complete set of Federal Standards of Identity to cover all types of processed orange juice. These standards will define and regulate the product known as chilled, or cartoned orange juice, canned orange juice, reconstituted orange juice (the product made from concentrated orange juice and water) and the various types of canned and frozen concentrated orange juice. These Food and Drug Standards were published in the Federal Register on November 6, 1956 and it is quite possible that they will become effective in the near future.

HISTORICAL

The idea of supplying the consumer with fresh single strength orange juice is not new. For years many people have realized what a popular item fresh citrus juice would be with the housewife and what a potential savings if the juice could be delivered in a fluid form instead of in the orange. Many of you are probably familiar with the ambitious undertakings of two large dairy concerns in the early 1930's. These dairies, in an attempt to provide their customers with a fresh single strength orange juice, procured a juice extraction plant here in Florida and would extract orange juice, package the juice in individual containers and freeze it. The frozen containers were then transported to the distributing dairies who delivered the frozen contain to the doorstep. Some of the product thus produced and distributed was acceptable but as a whole the undertaking was such a failure and economic disaster that for the next twenty years no one seriously considered investing money in either the fresh juice program or in research directed toward increasing the science of food technology to a point where such an endeavor would be practical.

During the intervening years between that first bulk undertaking and the early 1950's numerous small enterprises concerned with the extracting and distribution of fresh

orange juice flourished both in the North and here in Florida. Most of these enterprises were very small in scope and considered of merely extracting enough juice daily from fresh oranges to supply an established route. The life, or palatability, of the product thus produced was measured in hours instead of days or weeks and was limited to a local area instead of widespread distribution. The success of these small routes indicated that there was still an interest in a fresh citrus juice and that there was a good potential market for a product offering the convenience of fluid juice combined with the good flavor of fresh, unprocessed orange juice. Naturally these small enterprises were seasonal in nature and had to depend on the type and quality of fruit that was available on the fresh fruit market.

For the last decade there have been several concerns in the state which have met with varying degrees of success in the business of distributing cartoned single strength orange juice. Some of these concerns depended primarily on local consumption of their product with out-of-state export only during the peak of the citrus season. Others survived by establishing markets in large cities using the best juice available during the peak of a growing season. When the best fruit was gone an inferior juice, or orangeade, was substituted until such an adverse consumer reaction was incurred that the market in that area had to be closed. The next year the same process was carried out in another city and with similar results. Fortunately the physical plant of these concerns were not large enough to ruin the good name of Florida citrus in too many cities, but in those cities where they did operate, it is still virtually impossible to convince the dairyman that there is a good, or stable, cartoned orange juice available. During those days there was no regulation of any type on the producers and anything which could be sold, as well as a lot of material which could not be sold, was allowed to leave the state under the label of Florida orange juice.

METHODS OF PRESERVATION AND PRODUCTION

Before any discussion of methods of production and preservation it would be well to review briefly the chemical and bacteriological nature of orange juice so as to establish a basis for the measure of efficiency of any preserving or stabliizing technic. As most of you know, orange juice is a very complex mixture of chemicals in a water solution. In addition to the easily recognizable sugars and acids there are numerous chemical esters, compounds, and trace elements which account, in their own way, for a lot of the flavor, aroma, and color of orange juice. In the quality usually packed for chilled juice distribution the sugars will amount to 10-13 percent of the total weight, the acid will range from 0.6 to 1.1 percent of the weight and the rest of the chemical compounds will add only a minute part of the total weight. By far the major component of orange juice is water. Nature in its wonderful way of providing for its own has taken all of the chemical components which we find in the orange and by a series of intricate enzymatic and biochemical changes has established delicate flavor and aroma in the orange juice which man in his laboratory has never been able to duplicate. Protecting and saving this delicate flavor of fresh orange juice is the most challenging task which faces the citrus food technologist today. This flavor can be destroyed in many ways, some of which will be listed here:

1. Use of excessive amounts of low solids, or poor quality fruit.
2. Use of immature or overripe fruit in processing.
3. Inclusion of undesirable fractions of the orange by excessive pressures in attempting to extract too much juice from the orange.
4. Improper processing technics such as overheating or otherwise mechanically destroying the flavor.
5. Inclusion of an excessive amount of peel oil.

Most of these flavor losses are mechanical in origin and can be eliminated or minimized by careful processing technics.

After the juice is extracted and packaged it can, and does, lose its flavor due to three principal reasons:

1. Microbial fermentation.
2. Enzymatic action.
3. Chemical changes or decomposition.

Microbial fermentation is the term used to refer to the action caused when yeast or bacteria utilize part of the natural components of the juice and convert them into products of their own metabolism. When this happens the orange juice diminishes in its natural flavor and takes on the taste of the metabolic products produced by the microorganisms. This will range from the sharp alcoholish taste usually produced by yeast to a myriad off-flavors caused by several different types of bacteria. There are only three methods of protection against this occurrance. First is the use of a chemical food preservative which will either kill the microorganism or retard their metabolic processes. In addition to a law against adding chemical preservatives to chilled orange juice, most of the preservatives now available produce off-flavors of their own when added

to orange juice. The second method of avoiding fermentation is to use an accepted method of physical treatment to either kill or remove the bacterial from the extracted juice. Methods being used to accomplish this will be discussed a little later in this paper. The third method of avoiding fermentation is the use of refrigeration to slow down the reproductive cycle of the microorganisms and to retard their metabolic processes to such a degree that the metabolic by-products will not have had a chance to become noticable before the product is consumed. It is theoretically possible to completely sterilize orange juice so that no microbial action takes place as is done in canned orange juice and in most other canned foods. The great disadvantage of this procedure is the fact that such drastic treatment destroys most of the fresh flavor which the consumer demands. The second type of flavor loss, or change, is due to any one of the several reactions caused by enzymatic systems within the juice. As a rule these are easily controlled by destroying the enzymatic system with heat. To date the enzymatic changes have been no problem to the modern chilled juice processor. The third type of flavor loss is due to chemical changes or decomposition which take place in the juice regardless of enzymatic or bacterial action. These changes are mostly oxidative in nature and the biochemistry of these changes is far beyond the scope of this paper. As a rule these changes are not stopped by any of the processing technics but they can be minimized by several factors and may be greatly suppressed by the use of good refrigeration. These changes are strictly chemical in nature and the speed of the chemical reaction is controlled by the temperature of the solution in which the reaction takes place. In many cases in the industry today the oxidative changes are the ones which show up first and in those cases they have made the juice unpalatable before the microbial action has reached a point where the results of fermentation were noticed.

Most of the chilled juice produced in the state is being extracted and processed along the same lines as canned orange juice or frozen concentrated orange juice. This procedure involves the washing and sorting of fruit and the extraction of juice from the oranges with one of the commercial extracting machines that are available. Careful attention is given to the sanitation of the product in an attempt to have the lowest possible number of bacteria in the extracted juice. The juice is usually single finished using a somewhat larger finisher screen than is used for frozen concentrated orange juice. After finishing, the juice is usually processed in some manner to reduce the number of live microorganisms in the finished product and to stabilize most of the enzymatic systems found in fresh orange juice. The methods used in this particular stage of treatment will vary from plant to plant. Some plants claim to use only a patented ultra-violet ray treatment to prolong the shelf life of their product. Other plants use a high temperature-short time pasteurization process which has become almost routine in most of the concentrate plants. This type of pasteurization is done usually with commercially available equipment designed for the milk or food processing industry. Pasteurization is followed by cooling and chilling the juice to the filling temperature

in the shortest time practical. Still other plants have developed their own procesisng technics and equipment which will, in their opinion, perform an adequate job of prolonging shelf life and which will retain more of the delicate flavor of fresh orange juice than will the pasteuration technics. At the present time most of the plants are not particularly interested in competitors knowing the exact methods which they employ, the exact time and temperature of pasteurization if this process is used, or the other measures which they employ to give a maximum stablization with the minimum of flavor loss.

The packaging end of the production operation is generally the same in all the plants producing chilled juice. Most of the variation is due to the difference in volume of the total pack. Most of the product produced in the state is packed in waxed fiber board cartons which have been manufactured in one of the modern can factories in the state. The empty cartons are transported to the plant in bundles wrapped with paper. The individual cartons are filled with juice using regular milk filling machines. At least two plants in the state have filling machines which manufacture the carton and coat it with wax in connection with the filling operation, but by far the majority of the total state pack is filled into ready made fiberboard containers. The juice is chilled to just above the freezing point in most cases before it is filled into the carton. Immediately after filling, the cartons are placed into single service corrugated boxes for shipment to market. The task of placing the cartons in the corrugated boxes is done by hand in most plants but some of the larger producers have automatic casing machines which are powered by compressed air in order to minimize the chance of mechanical injury to the fragile carton. Most of the plants either date or code the cartons as they are filled in order to allow a satisfactory method of stock rotation to be carried out by the eventual distributor.

There are several reasons for the success of this product today after such a dismal failure a few years ago. Some of these reasons are to be found in better refrigeration, quicker transportation and communication, and other increases in mechanical technology. In spite of the increased knowledge in the mechanical end of production a substantial factor in the recent success of this product is the increased knowledge in the science of food preservation and food technology. As indicated, most of the chilled juice produced at this time is treated in some manner to retard its decomposition. Without such treatment it would not retain its palatability for a period sufficient to reach the consumer in an acceptable manner even with the advances in refrigeration and transportation.

DISTRIBUTION

As indicated in several of the preceding paragraphs one of the important items in considering the production and marketing of chilled orange juice is the method of distributing the product from the point of production to the eventual consumer. It must be remembered when thinking of a distribution program that even with the best of care chilled orange juice is a highly perishable product. The elasped time between production and consumption as well as the storage temperature during that interval can mean the difference between a product which meets a high consumer acceptance and one which will cause an adverse consumer reaction. The length of storage time, and the storage temperature, will vary between plants and is limited by the size of the physical plant which may be available at any one location. Most producers try to hold their storage temperatures between 30° and 35° Fahrenheit. All producers hold the finished product in their coldrooms for the shortest period of time. By the same token it is unwise to oversupply any one distributing point thus forcing the retail distributor to hold his supply for an abnormally long time before it is consumed by his customers. By far the most successful means of distribution is one where frequent deliveries of small quanities are made instead of monthly or bi-monthly delivery of large quanities. As a rule the chilled juice producer has more ideal storage facilities than the dairies or stores in which the product must be stored.

Distribution can be divided into two parts, the first being the process of delivering the product to the market area and the second being the retail level or the actual delivery of the product to the consumer. The first phase, or the delivery of the product from the producing plant to the retail distributor is carried out in several ways at the present time. The most common method of shipping is by use of refrigerated tractor trailer units. Most of these trucks have installed trailers equipped with mechanical refrigeration units which are capable of holding a desirable shipping temperature regardless of the outside weather conditions. Some producers have their own fleets of refrigerated trucks and ship as high as seventy-five trailers a week while other producers have to accumulate juice for a week in order to load out a single for-hire unit. As a rule these trucks can move approximately 12,000 quarts of juice at a trip depending on the load limitations of the states through which they must travel. Trucks have the distinct advantage of being able to deliver the product directly to the dairy or the food store warehouse, and of being able to make numerous drops of small orders instead of a one drop delivery of the total load. In addition to the refrigerated trailers which transport the cartoned product there is a small volume of juice leaving the state in bulk by tank truck. This juice is extracted here in Florida and transported to a bottling site in the North by either insulated or refrigerated tank trucks.

The second means of transportation from the Florida plant to the distributing outlets is by refrigerator railcar. Although this mode of transportation is quite a

bit cheaper than trucks, it has several very pronounced disadvantages over truck transportaion. The railcar weight requirements are quite a bit higher than trucks thus necessitating a 20,400 quart shipment instead of a 12,000 quart load. This could be a real disadvantage unless the railcar was destined for an area where the produced had established a rather heavy demand. Rail shipment is usually a one-drop arrangement which again calls for a heavy demand in one area before this method can be used advantageously. Rail shipment is somewhat slower than truck shipment thus utilizing part of the critical time between the production of this product and its delivery to the customer.

Compare a sample shipment to New York. Railroads give a fourth morning delivery while trucks make the same run in 36 to 40 hours, In addition to the time and convenience factors to be considered in comparising truck and rail shipment it must be remembered that the fiberboard carton is a fragile item and excessive jarring during any transportation will damage the containers causing leakers. It may be of interest to note that the railroads have recently petitioned the ICC for permission to cease handling chilled citrus juices because of what they claim to be excessive claims for damaged merchandise. This petition has been denied for a period of six months.

In addition to the rail and truck methods of transportation there is a third method which made its appearance in the industry in February, 1957. This was a bulk shipment by sea venture which was undertaken by one of the larger producers. This type transportation is a radical deviation from conventional methods of handling and transportation orange juice. The introduction of this method attracted nationwide attention to the cartoned orange juice industry and to the product which was being made available on the Northern markets. Because of the interest created by this unique method of transportation the whole procedure will be discussed briefly. The orange juice processor constructed a processing plant on Florida's East Coast located at a good man-made harbor at Cape Canaveral. At this plant the juice is extracted from the oranges, processed, and chilled to just above the freezing point. The juice is then pumped into huge, sterilized, stainless steel tanks which had been built into the cargo holds of a large steamship. These stainless steel tanks are fully insulated and maintain the near freezing temperatures of the juice until its delivery in New York City some sixty hours later. At the New York end of the operation the citrus processor constructed a modern bottling plant complete with huge stainless steel storage tanks located in refrigerated rooms. When the ship arrives at the New York dock the juice is pumped through stainless stell pipelines to the storage tanks located ashore. From these tanks the juice goes to the carton filling machines in a method exactly similar to the methods used in Florida. The juice is maintained under good refrigerated conditions at all times and handled entirely in stainless steel tanks and lines. Admittedly, this method of transportation is unique within the industry but it has numerous economic advantages with few of the practical drawbacks which one may expect from such an unorthodox plan. Assuming one trip a week for the vessel, the elapsed time between production of the juice and a packaged product ready for delivery in New York will be about the same as juice transported by rail. The actual cost of transportation per gallon of juice will be only a fraction of the cost now assessed using either

truck or rail. By using a pumping system the cost of stevedorage is held to a minimum and the process of taking on or discharging cargo is only a matter of a few hours. The quality of the delivered product is a function of the efficiency of the process used in stablizing the juice as well as the length of storage time and the storage temperature. The actual size of container, whether it be a one-quart paper carton or a 50,000 gallon stainless steel tank, is of little importance provided the other important factors remain the same. The greatest disadvantage that chilled juice has at the present time in its competition with other citrus products is the higher retail cost which is a reflection of the higher transportation cost of this product. Canned orange juice shipped to the same point as chilled orange juice would have the same weight but would not require the additional cost of refrigerated shipment. Frozen concentrated orange juice would require the additional cost of refrigerated shipment but after reconstituting in the North the actual transportation cost per gallon of single strength juice would show the reconstituted product to be only a fraction of the cost per gallon of chilled juice. Now that sea transportation has proven to be practical it is anticipated that the reduced cost of this method of transportation will help make the retail price of chilled ornge juice more competitive with other types of processed citrus juices.

(Continued Next Issue)

GROWER'S OWN PAGE

LONE LADY DEVELOPS OWN CITRUS GROVE

(Continued from page 11)

smoothed the dirt over the seed. I used half Indigo and half Alyce clover. I didn't get a very good germination for there was a long period of dry weather and believe me, I sweated blood. About once a month I'd go over every tree with the scuffle hoe to keep them clean.

This spring I again sowed a cover crop. I ordered early Indigo from a man that had advertised in the Bulletin but I got more of tall variety of beggarweed than I did Indigo. I started out in the spring with my fertilizer program, recommended by my fertilizer man and again started the scuffle hoe but the rains came and the growth got so heavy I found it was impossible to keep up with it so I had to stop. This spring the trees had a heavy bloom but I didn't expect them to hold any fruit. Imagine my surprise when my fertilizer man checked and told me I would have at least two hundred boxes. After I disked and sowed the last cover crop I took several snap shots of which I am enclosing. I think you will agree with me that for trees only two and a half years old (pictures were taken May 12 of this year, trees were planted Nov. 2, 1954), that they have responded beautifully to individual care and I'm mighty proud of them. I have been told not to do any disking until the crop is ready to be picked in November.

Most of the fruit is clean but I have some rust mite. When I found it was in the grove, I bought some wettable sulfur and with a three and a half gallon knap-sack sprayer strapped to my back, I sprayed over half the grove. Again rains stopped that procedure but I'm hoping that I can go over it again soon. I since have purchased a sprayer that I can hook to my tractor. I bought four fifty-five gallon drums and now the work will be much easier. Oh yes, I added Parathion to the sulfur to kill some scale so the first half of the grove is in pretty good condition. The other half is NOT too bad so I'm not very worried. I have been told that trees as young as mine ordinarily should not be so large or have such a heavy crop so you can imagine how grateful I am that my work has paid off. There is a ten acre Hamlin grove close to me and they tell me that when their crop is sold, the buyers will take mine also, providing of course, it tests right.

I still have 18 acres in Pangola and am running 20 head of cattle. Ten head are registered Herefords and the balance are good grade animals. I also take care of them, feeding them in the winter. If I only knew then what I know now, the whole 28 acres would have gone into Hamlins, but I'm mighty thankful that at least I have the ten acres. A year ago last spring, I planted a lot of rough lemon seed and when they were the right size, I transplanted them and fertilized them regular until they grew like weeds. I had a man come in and bud me a hundred and fifty trees to Hamlins and this fall I shall replace those empty places for all in all now, I have around 600 trees.

Since I have checked for termites and have used cholorodane I have lost no more trees. All those I planted myself have grown, I haven't lost a one. Some grovemen told me

that I got a poor stand of trees, some had been planted too deep. When I found that out, I soaked them well with water, took a fork-spade and lifted them. I marked each tree so I could keep check on them. Apparently, that is what they needed for they really took out.

MRS. ESTELLA M. PLACIE.

HOW TO BUY . . . AN IRRIGATION SYSTEM

(Continued from page 19)

amount of water through nearly any size mainline if the pump has sufficient capacity and is powered by a sufficiently large power unit. The smaller the pipe, the lower the initial cost; however, a larger pumping plant and more fuel will be required to operate the equipment for the entire life of the system.

The following (Example 1) shows a method for determining the most economical size mainline for given conditions. All these conditions have a bearing on the selection of the size mainline and a change in any one of the stated conditions could possibly change the size mainline which would be most economical.

(Part III In Next Issue)

MANATEE COUNTY CITRUS SCHOOL

Members of the Manatee County Agent's office met with the Citrus Advisory Committee in Palmetto and planned a Citrus School. Members of the Advisory Committee include William Mixon, Sr., Henry Prine, Bob Burnett, Leo Wilson and Louis Carlton.

This school will be the only one held this year on the West Coast and will be concerned solely with the problems of the grower near the Coast.

There will be five meetings on Thursday night's, October 10 - November 7, at the Agricultural Center in Palmetto. The major topic for discussion will include irrigation, drainage, and general water control of citrus in the West Coast area, and also care and planting of young citrus. The speakers include Dr. A. P. Black, Fred P. Lawrence, Jack T. McCown, from the University of Florida and Dr. H. W. Ford of the Lake Alfred Experiment Station. All commercial citrus growers on the West Coast are invited to attend.

CITRUS INSECT CONTROL FOR OCTOBER, 1957 . . .

(Continued from page 3)

been observed where the dust was applied.

Aramite 45W at 2/3 pound per 100 gallons is safe to use on any variety.

Ovotran at 1 pound per 100 gallons can also be used if it has not been used more than once during the year because mites become resistant to it after repeated applications. Control with ovotran is slow since it does not kill the older mites. For a quick kill of adult mites, use either 1/4 pint of 40 percent TEPP or ½ pound of parathion per 100 gallons with the ovotran. Ovotran can probably be used to the best advantage during the winter months when mite eggs are numerous.

Systox at ½ to 1 pint per 100 gallons is very effective. Lower concentrations may give a good mite kill but a shorter period of control may be expected. When using Systox, use the same precautions as with parathion.

(Continued on page 30)

The LYONIZER

COMPILED BY THE LYONS FERTILIZER COMPANY

Reports Of Our Field Men . . .

HIGHLANDS AND POLK COUNTIES
J. K. Enzor, Jr.,
P. O. Box 1304 Winter Haven, Fla.
Phone Cypress 3-4716
R. E. Lassiter, Jr.,
1168 Lakeshore Blvd.
Lake Wales, Fla.
Phone 3-3813

Due to the recent heavy rains in this area many growers are fertilizing their young groves at this time. This will probably be the last application to young trees this fall.

We are still observing continued good results from the use of Zineb with the summer oil sprays. Many growers who are usually spraying at this time for rust mite have been able to leave their sprayers and dusters under the barn. There is much speculation as to whether this will have any effect on the purple mite situation this fall. There have been some reports of Zineb failing to control rust mite for an extended period of time as it has in other blocks. So far there has not been a real good explanation of this, however, coverage was very definitely a factor.

At the time of this writing there has been quite a bit of grapefruit shipped. While the fruit this year is very good quality many of the packing house men are complaining of poor pack out as a result of melanose. This will be a big factor this year.

We have noticed in a few blocks that both red and purple scale are coming up. These insects should be watched closely, especially red scale. If populations increase too much parathion should be used.

There has been much speculation as to the amount of fruit in the state this year. To us in this area the grapefruit crop looks very light. There seems to be a pretty good crop of early oranges but pineapples seem to be on the light side. We have been unable to see the tremendous crop of Valencias that some people are reporting.

NORTH CENTRAL FLORIDA
V. E. Bourland
Winter Garden, Fla.
Phone 107

We had lots of rain, then some sunshine, so the water got off of most groves, but it looks now we are going wet again.

Groves are looking good and quite an amount of fruit being picked. Sizes are very good on all varieties. Most groves have been chopped and young trees are being fertilized for the last time before cold weather gets here.

SOUTH HILLSBOROUGH AND MANATEE COUNTIES
Eaves Allison
P. O. Box 365, Sarasota, Fla.
Phone Fulton 8-2611

Hurricane Bessie dropped from three to five inches of water on us in this area. That created quite a problem for the vegetable growers, what with their plants small, their fields wet and the grass a'growin'! However, so far nobody is badly hurt and some were lucky and missed the rains in volume.

Tomatoes in some fields in the Ruskin section are a quarter of the way up the stakes and are looking fine. Pastures are wet but the grass is holding well.

Citrus is beginning to mature and already some crops of green grapefruit have been picked where they passed the maturity test. In another month or two they would eat right good.

Cover crops in some groves are being chopped, while in others it is still standing to help in throwing off any excess soil moisture that the balance of the hurricane season might bring. Plans are now forming for that fall application of good Lyons Fertilizer. Groves that have been receiving our tried and true citrus mixtures are carrying good heavy crops of fruit which is sizing up properly now.

EAST HILLSBOROUGH AND PASCO COUNTIES
E. A. McCartney
914 River Hills Dr.
Temple Terrace, Tampa, Fla.
Phone WE 8-2852

Citrus fruit is sizing up considerably over last year at this time due to the rains we have had over most of this territory which was 56 inches as of September 1. This will vary as this information is from the Tampa Tribune. This will no doubt cause the trees to take up more moisture and fertilizer and leaching will take up the rest. So there should be a good application of fertilizer put on this fall to take care of the crop on the trees and develop the fruit buds for the coming season. The fall application is definitely the most important. Most groves have been chopped or disked. Cover crops were extra heavy which was also due to the rains. New growth in some sections has not stopped growing all summer so if that is an indication we can look for another good crop next year as there will be plenty of new wood on the trees.

SOUTH POLK, HIGHLANDS, HADDEE, DeSOTO AND SARASOTA COUNTIES
C. R. Wingfield
Avon Park, Fla.
Phone Glendale 2-81881

Much of the activity in citrus groves has been the working down of the cover crop and watching for insect build-up. Where necessary rust mite controls are being applied. Purple mite is being found in spotted areas but does not appear to be doing much damage at the present. The rains that have been regular and in some cases very heavy have kept the groves in very good condition but a lot of split fruit has been noticed. Generally the fruit crop is of good size and with some favorable weather we will soon be moving early oranges, if not already. Grapefruit is breaking in color and the volume is increasing daily.

Lyons Fertilizers Help Build Successful Grove

Elsewhere in this magazine is a most interesting article by Mrs. Estella M. Placie telling of her success in developing a citrus grove. She attributes a portion of her success to the fact that she "has been using Lyons Fertilizer" and that Jimmy Hoffman, Lyons representative, has been her adviser.

CITRUS INSECT CONTROL FOR OCTOBER, 1957 . . .

(Continued from page 27)

Oil emulsion at 0.7 percent oil can be used on non-bearing trees or on trees where fruit color and solids are not factors.

Wettable sulfur can be used with all of the above miticides except oil, and lime-sulfur can be used with ovotran.

Rust Mite Control: One gallon of lime-sulfur plus 5 pounds of wettable sulfur is a very effective spray for rust mite control, but it may cause injury of fruit on Temples, tangerines and early varieties of oranges. Wettable sulfur, 10 pounds per 100 gallons or a thorough application of sulfur dust may be applied on any variety. However, a dust is usually not as effective as a spray, especially during periods of rainy weather.

Zineb has been used to a considerable extent this past summer and has given very good control where it has been used at ½ to 1 pound per 100 gallons. Where zineb was used during the summer, the mite population on fruit may be low, but some of the leaves may have a heavier infestation. If the leaves or fruit become heavily infested, control measures should be taken because rust mites can cause as heavy a leaf drop as purple mites. Zineb has been mixed with Systox for the control of purple mite and rust mite, but in experimental work, it has not been mixed with DN Dry Mix. Since zineb has no wetting agent and DN has very little, control of purple mite may not be very satisfactory. Zineb should not be used in alkaline solutions.

Grasshopper Control: There are several materials that can be used for grasshopper control, either as a spray or a dust. Where treatment is necessary, any of the following insecticides may be used on a basis of the technical material per acre, Toxaphene 1½ pounds, Chlordane 1 pound, Aldrin 2 ounces, Dieldrin ½ to 3/4 ounce. Trees as well as the cover crop should be treated. None of these should be applied where the crop is to be picked within 30 days of the application.

Details of spray schedules and the various materials used will be found in the "Better Fruit Program" and this should be consulted to determine which materials may or may not be combined. For further information, consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

A new twist in snacks may be found in the sweetpotato, says the USDA. Sweetpotato chips, dice, julienne strips, and frozen French fries were found to be delicious and good possibilities for commercial food products in recent tests.

For several seasons, Florida has produced a third of the world supply of oranges, tangerines and grapefruit.

Classified Ads

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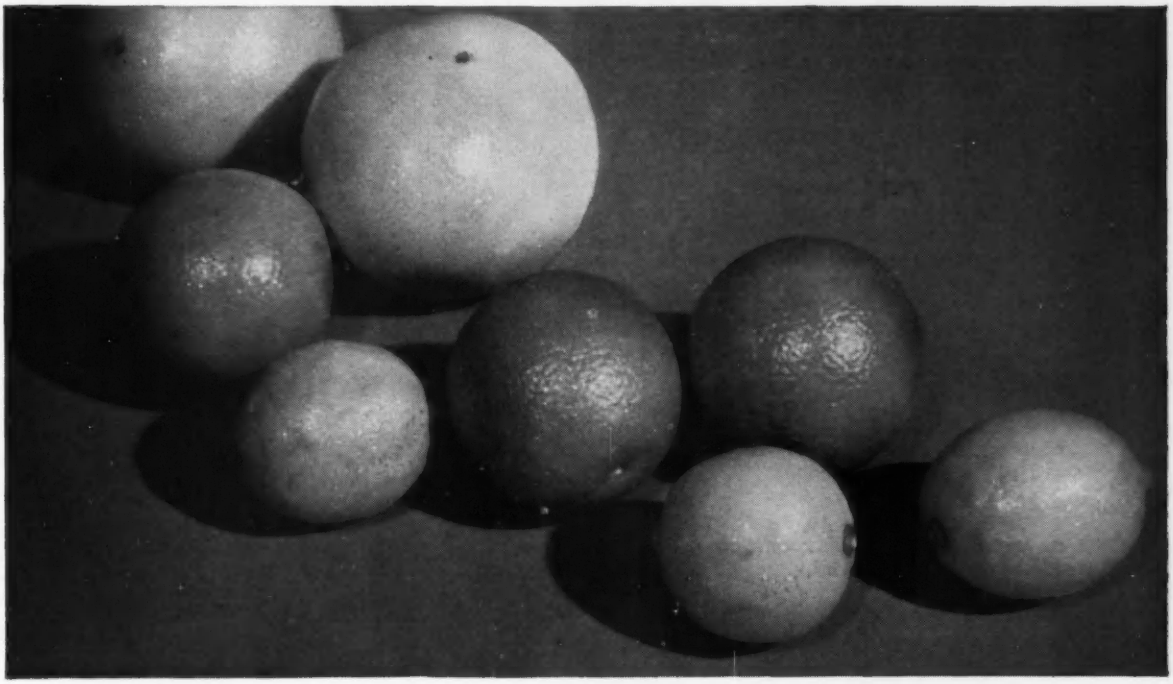

"No mite resistance to

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has been observed,"*

says major grower association

Aramite is death on red mites in citrus, and many other kinds of mites that attack cotton, fruit and vegetable crops, nursery stock and shade trees. Compatible with most commonly used insecticides and fungicides, Aramite assures better crops, higher profits. Aramite kills more mite species than any other control and is the most widely used specific acaricide in the United States. Apply Aramite, mightiest of miticides and rule out the problem of resistance.

*From pest control authority on file.

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United States Rubber

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Every grower knows that his trees must be provided with the finest cultural practices. They must be cultivated and sprayed properly and at the right time.

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